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ENTOMOLOGICAL NEWS

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Biological Observations on Ectemnius with Particular Reference to their Ogcodes prey (Hymenoptera: Sphecidae.—Diptera: Acroceridae)

By ROBERT C. BECHTEL [1] and EVERT I. SCHLINGER [2]

It is known that various species of crabronid wasps provision their nests with adult flies. Accurate reports of these associations are not numerous, however, and there are apparently no published records of specifically identified American crabronid wasps associated with the dipterous family Acroceridae. For this reason preliminary observations are presented which indicate that there may be a frequent predator-prey relationship between certain species of the crabronid genus *Ectemnius* Dahlbom and the acrocerid genus *Ogcodes* Latreille. Future observations and research should uncover additional facts needed to understand fully these relationships.

The first apparent record of crabronid wasps storing acrocerid flies as food for their larvae was by Westwood (1840) who stated that van Heyden and Audouin had observed that numerous specimens of *Ogcodes gibbosus* (Linnaeus) were selected as food for the progeny of a species of *Crabro*. Other authors reporting similar relationships were: Tournier (1878), Sahlberg (1883), Gorham (1902), Enslin (1922), Maréchal (1934), Leclercq (1941, 1954), Bristowe (1948) and Sabrosky (1948). Our knowledge of these relationships through 1954 was summarized by Leclercq (1954: 318–319). We infer from this that only crabronid wasps of the genus *Ectemnius,* subgenus

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Hypocrabro Ashmead, are known to have this relationship with the Acroceridae. Furthermore, all of the above records (except Sabrosky (1948) which refers to a Nearctic species) pertain to a restricted association with the widespread Palearctic crabronid, *Ectemnius* (*Hypocrabro*) *rubicola* (Dufour and Perris), even though other species of this subgenus are found in the same region.

Another important fact is that all of the recorded acrocerid prey belong to the genus *Ogcodes*. These are *O. gibbosus* (Linnaeus), *marginatus* (Meigen) (= *pallipes* Latr.), *pallipes* Latreille and *zonatus* Erichson. As normal *Ogcodes* specimens appear to be of a suitable size for use by these wasps, it is likely that certain of the Holarctic genera *Acrocera* Meigen, *Opsebius* Costa and *Pterodontia* Gray would be satisfactory also. In addition to size, abundance of the prey may be paramount in the selection of *Ogcodes,* rather than any preferential selection of flies. This is substantiated by the fact that species of fourteen families of Diptera have been recorded as hosts for *Hypocrabro*. On the other hand, we do not have adequate observations on the biologies of the various crabronids and perhaps future work will demonstrate that other genera and/or species provision their nests with acrocerids.

To our knowledge only two published articles have reported the use of acrocerid flies as hosts for Nearctic wasps, and only one specified association with a crabronid. James (1938) recorded that a wasp (species unknown), collected at Boulder, Colorado, February 28, 1933, by C. H. Hicks, stocked its nest with specimens of *Ogcodes albicinctus* Cole. Some of these specimens have been examined and are males of *O. eugonatus* Loew. The second report was made by Sabrosky (1948) who recorded that ten male specimens of *O. pallidipennis* Loew (western subspecies) had been collected from a crabronid nest at Oak Creek Canyon, Arizona, June 8, 1940. The collector, G. E. Bohart, noted that "this species of wasp was not seen to use any other species of fly." An examination of these specimens showed them to be a new species of *Ogcodes* (species No. 1, Schlinger MS.).

Two other observations record *Ogcodes* species from wasp nests, but as far as we have been able to determine the wasps were probably spider-killing forms. Champlain and Knull (1923) recorded adults of "*Oncodes dispar* (Macquart)" in a wasp nest from a decaying log at Wildwood Park, Harrisburg, Pennsylvania, in August. They stated that "The wasp apparently caught the spiders that were infested by the larvae of *Oncodes*, stored them in cells with her eggs, sealed the gallery and departed. The *Oncodes* larvae consumed the spiders and possibly the wasp larvae, then transformed and were unable to get out. Remains of the spiders were present in the cells." Cole (1919) reported that a specimen of *O. palidipennis* Loew had been bred from a nest of *Sceliphron cementarius* collected at Coulterville, Illinois.

As previously mentioned, no positive information other than the verified record of Sabrosky (1948) has been published on the association of crabronids and acrocerids in the Nearctic region. It was of interest, therefore, when several nests of *Ectemnius* (*Hypocrabro*) *spiniferus* (Fox) were found to contain specimens of *Ogcodes eugonatus* Loew. *E. spiniferus* is confined to the western part of the Nearctic region and is common in California. For a more detailed distribution see Krombein (1951: 1027) and Leclercq (1954: map 30).

In attempting to ascertain the association of crabronids with this dipterous family, the excellent "Monographie . . . Crabroniens" of Leclercq (1954) was consulted. This work gave only a single Palearctic species, *E.* (*H.*) *rubicola*, as utilizing acrocerid flies. On the basis of various characters, we assumed that *E. spiniferus* could be closely related to *E. rubicola*. This assumption was verified by J. Leclercq (in litt., 1956) who stated that "From a morphological point of view it is certain that *Ectemnius* (*Hypocrabro*) *spiniferus* and *E.* (*H.*) *rubicola* are closely allied. I should say however that the closest relative of *spiniferus* in the Palearctic region is by all means *laevigatus* (DE STEFANI)."

He also stated that there was little information on the habits of *laevigatus*, and it probably provisioned its nests with acro-

cerids. Leclercq (in litt., 1956) also mentioned that if species groups were erected in *Hypocrabro,* one such group would include *laevigatus, rubicola,* and *spiniferus.*

The prey species, *O. eugonatus* (= *O. albicinctus* Cole, of authors), is not common in California north of the Tehachapi Mountains. We have examined specimens only from Turlock (Stanislaus County) and Davis, Elkhorn Ferry, and Putah Canyon (Yolo County) in northern California. This species is distributed throughout North America where it ranges from Canada to southern Mexico, but it appears to be most common in the great plains and eastern United States. Furthermore, *eugonatus* may be conspecific with the European *O. zonatus* Erichson. If this conspecificity should prove to be correct, it would be of particular interest in that the close relationship of *rubicola* and *spiniferus* would be further substantiated biologically.

The material upon which the following new biological data presented in this paper are based was collected at Elkhorn Ferry, Yolo County, California, February 12, 1956, by R. C. Bechtel.

The linear nests of *spiniferus* were located in dead or injured and dying twigs of blue elderberry, *Sambucus coerulea* Rafinesque. The cells and their respective partitions of macerated elderberry pith were found at the inner end of the tunnels. These tunnels varied in length from 19–36 mm. Details of the cell contents are summarized in table 1.

The length of the cells varied greatly, ranging from 8–22 mm., whereas the diameter of the cells varied only from 5–7 mm. The partitions exhibited a variation in length (4–7 mm.) similar to that of the cells, but these lengths appeared to have no correlation with the associated cells.

An examination of the cell contents indicated that they could be divided into six groups as follows: Crabronids only; crabronid cocoons only; fly prey of crabronids (*Hylemya, Ogcodes* and *Sphaerophoria*); crabronid cocoons, fly prey of crabronids and scavenger flies (*Megaselia*); parasite (*Monodontomerus*) or predator (*Cymatodera*) of crabronids and fly prey; and fly prey and scavenger flies.

Certain cells, other than those which harbored a parasite or predator, or from which no *spiniferus* adults emerged, contained cocoons in which dead crabronid larvae were found. The *Megaselia* apparently did not cause the death of the larvae since these flies did not occur in all of the cells. Also, there was no evidence of cocoon penetration when they did occur. Therefore, the cause of death was unknown.

Approximately one-half of the specimens of *O. eugonatus* were in good condition. The other half were partly or almost entirely eaten. Some of them lacked the head or legs, while others were more completely mutilated, with only part of the

TABLE 1. Cell Contents of *Ectemnius* (*Hypocrabro*) *spiniferus* (Fox)

Twig	Cell	*Ect.*	*Ogc.*	*Hyl.*	*Sph.*	*Mon.*	*Cym.*	*Meg.*
1	1		7 ♂♂		1			
	2		10 ♂♂	1				
	3	1 ♀						
2	1		2 ♂♂	5				31
	2		2 ♂♂	5				19
	3	1 ♂						
3	1	1 ♂						
	2	1 ♂						
	3	1 ♂						
	4	Coc.						
	5	Coc.						
	6	Coc.						
4	1	Coc.	5					4
	2		2 ♂♂			1		
	3	Coc.	3 ♂♂					6
	4	Coc.	8 ♂♂					5
	5	1 ♂						
5	1		2				1	

Abbreviations:

Ect.—*Ectemnius* (*Hypocrabro*) *spiniferus* (Fox).
Ogc.—*Ogcodes eugonatus* Loew.
Hyl.—*Hylemya* sp.
Sph.—*Sphaerophoria* sp.
Mon.—*Monodontomerus* n. sp.
Cym.—*Cymatodera ovipennis* LeConte.
Meg.—*Megaselia* sp.
Coc.—Cocoon.

abdomen and/or thorax and wings present. As a result, we were not able to determine the sex of several specimens.

Individuals of the other fly prey, an anthomyiid (*Hylemya,* det. C. W. Sabrosky) and a syrphid (*Sphaerophoria,* det. W. W. Wirth), were in such poor condition that specific identification was impossible. The numerous wings and body fragments in the cells indicated that additional specimens of these genera had been present, however.

A single specimen of a new species of the torymid genus *Monodontomerus* (det. P. H. Timberlake) was reared from one *Ectemnius* cocoon. Peck (1951: 528–529) listed various Hymenoptera as hosts for *Monodontomerus,* but no Crabronini were included. Therefore, this appears to be a new host record for the genus.

A clerid predator, a larva of *Cymatodera ovipennis* LeConte, was found in one twig. This larva had chewed a hole in a *spiniferus* cocoon, eaten approximately ⅔ of the crabronid larva, and was later observed to consume the remainder of it. There were indications also of two additional cells which the predator presumably had destroyed.

Several of the cells contained larvae and pupae of a phorid, *Megaselia* sp. (det. W. W. Wirth). Various authors have reported a parasitic relationship of *Megaselia* species with insects (Clausen, 1940: 385–386), but this species appeared to be a scavenger. It is of interest that in the cells in which the crabronid larvae failed to develop, the adult *Ogcodes* specimens were not used as food by the phorids, while the other host specimens were almost entirely consumed. Also, some of the cells in which this scavenger occurred had a blackened appearance due to the presence of a fungus.

In addition to the above observations, two other instances of a crabronid-acrocerid relationship have been noted. Four male specimens of *O. eugonatus,* collected at La Mesa, San Diego County, California, January 22, 1953, by F. X. Williams, were examined. A label on these specimens included the data "in *Crabro* wasp nest." Williams (in litt., 1956) stated that his notes read "La Mesa . . . also a nest of *Crabro* sp. with many

dead (last year's) acrocerid flies only, of one species in cells, and *Crabro* cocoons; . . . likewise in dead *Salvia* stems (*Salvia apiana* Jepson)." He stated also that he used the name *Crabro* in a general way, that the wasp could have been *Ectemnius* and that only the better acrocerids were retained.

Also, we have studied four male and three female specimens from Escragnoles Alpes, France, labeled "ex. *Crabro* nest." This record was of interest since it was the first time that female *Ogcodes* specimens have been found in a crabronid nest. Female *Ogcodes* seldom fly, but males make short, rapid flights at frequent intervals and are more subject to capture by female crabronids.

Another unverified association was found during the examination of twelve male specimens of a new species of *Ogcodes* (species No. 2, Schlinger MS.). The specimens were collected in San Bernardino County, California, elevation 6,000 ft., August 2, 1940, by J. A. Comstock. Labels on the specimens referred to a museum note which read, "12 Hymenopterous cocoons in the pith of *Sambucus relutina*. In one cell were the stored remains of 15 little flies (Cyrtidae), of which, though mouldy, a chloroform treatment made 12 available for mounting. All of these wasps had stored the same fly, but in case the larval wasp had matured, the flies were all consumed."

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A New Ambrysus from Mexico (Hemiptera, Naucoridae)

By Ira La Rivers, University of Nevada, Reno

Subfamily Ambrysinae Usinger, 1941
Genus Ambrysus Stål, 1862

Ambrysus drakei, sp. nov.

General appearance: A rather large, robust species with the mottled coloration typical of Ambrysi. Size 12.0–13.0 mm. long and 7.5–9.0 mm. wide. Dorsum lighter over prothorax and head, where the background color is light yellowish, darker brownish over hemelytra; embolia the only prominently light area in the otherwise dark hemelytra; scutellum with a faint reddish caste. Venter light yellow, slightly darker on abdomen, legs whitish-yellow.

Head: Sparsely punctate, shiny, comparatively flat; vertex only very faintly protuberant before eyes, forming an almost smooth, nearly flat contour between leading angles of the eye. Eyes essentially flush with general head surface; outer and posterior eye margins not forming a smooth, uninterrupted semicircle, but showing a slight angulation at their meeting points, which is the anterior inception of the thin but prominent border of the posterior eye margin. Labrum smoothly rounded, but its outline, rather than being an even semicircle, suggests a pointing of the tip; ratio of length-to-width 23::40 (58%), uniform in color; mouthparts similar to head in color, darkening toward tip. Head ratios are:

(1) total length to width (including eyes) 43::68 (63%)
(2) anterior distance between eyes to posterior distance 32::40 (80%)
(3) anterior distance between eyes to inner eye length 31::28 (90%)
(4) posterior distance between eyes to greatest length of head posterior to this line 40::10 (25%)

Pronotum: Moderately punctate, shiny; background color light yellowish, bearing five prominent brownish areas within the disc, composed of aggregations of brown spots in the manner typical of *Ambrysi* in general; posterior border rather broad, separated from disc by thin black line; lateral edges smooth, non-pilose, weakly curved, curvature more pronounced at hind angle (postero-lateral angle)—per cent of curvature (viewed perpendicular to the frontal plane of section of the animal as a unit) about 12% (av. 68::8); venter light yellowish, prominently pilose along posterior edge, particularly centrally, about the keel and the procoxal cavities; keel ridged anteriorly, flatly sloping posteriorly beneath median union of propleura, the slope smooth except for suggestion of transverse rugulosity—ratio of anterior keel ridge to total keel length (including posterior sloping face) 45::70 (64%). Prosternum free from propleura, and disappearing caudad beneath the latter. Propleura united along median line just posterior to prosternum. Pronotal ratios are:

(1) width between anterior angles to width between posterior angles 68::135 (50%)
(2) median length to greatest width 44::135 (33%)
(3) distance between anterior and posterior angles on same side to perpendicular distance between anterior angle and baseline of pronotum 65::62

Scutellum: A pale reddish brown with light yellow area at posterior angle and some lightening in color laterally; ratio of three sides, anterior and two laterals, 90::68::68.

Hemelytra: Background color nearly unicolorous brown-black, with some light yellowing, most prominently on embolia; rather shiny, punctate, each puncture with a whitish spot; embolium well defined at its posterior edge, rather broad for the genus (length-to-width 75::28 = 37%); emboliar crease very weak, barely noticeable in anterior one-fifth—embolium typically bicolored, light yellow in anterior two-thirds, reddish brown posteriorly with rather pronounced contrast between the two areas. Hemelytra rather markedly exposing lateral connexival spinose margins posterior to embolia, and attaining abdominal tip. Wings functional, as long as hemelytra, and possessing the usual large, "costal" cell.

Venter: The prothoracic venter has been discussed above. All connexival segments moderately spinose except Segment I, the angles being acutely prolonged posteriorly; Segment I angle is right-angulate, not protruding laterad of general body outline, and is non-spinose. Connexival Angles II–IV are the most prominent, becoming progressively larger anterior-to-posterior; lateral connexival edges essentially smooth, non-serrate, even with considerable magnification. Tip of female subgenital plate quadrisinuate in terminal outline, the two inner sinuosities grouped together as two low, rounded angles, the two outer sinuosities sharp-angulate and not reaching as far caudad as the median portion. Actually, this tip outline is a combination of the characteristics of *A. mexicanus* (*A. dilatus, A. hintoni*) and *A. fuscus;* the sinuation is indistinguishable from that of *A. fuscus,* and the left lateral asymmetry of *A. mexicanus* may be quite evident (see illustration). The male genital process is prominently developed, and greatly resembles that of a small *A. guttatipennis* or a large *A. mexicanus* (see illustration).

Legs: Prolegs—coxa and trochanter usual for the genus. Femoral incrassation about average, ratio of length to greatest median width 60::36 (60%); tibia average, combined tibia-tarsus, when closed, just attaining adjacent (proximal) end of femur.

Mesolegs—coxa and trochanter usual; femoral ratio of length to greatest median width 60::11 (18%)—length 2.6 mm.; tibia

with usual spination for the subgenus *Ambrysus*—distal end ventrally with two prominent transverse rows of spines set across tibial width, the terminal row set solidly across apex, the secondary or proximal row extending only about half way across tibial width—ratio of length to median width 55::8 (15%)—length 2.5 mm.; tarsus long, narrow, whitish, 3-segmented, the first segment very small and usually hidden by terminal spines, third segment terminating in two prominent, moderately curved claws.

Ambrysus drakei, holotype female and allotype. The enclosing, top outline represents the terminal configuration of the female subgenital plate as seen in ventral view with caudum at top; the slender, left-pointing structure below this outline is the male genital process.

Metalegs—coxa and trochanter usual; femoral ratio of length to median width 82::12 (15%)—length 4.0 mm.; tibia essentially an enlargement of mesotibia, although comparatively more elongate—ratio of length to median ventral width 93::9 (10%)—length 4.6 mm.; tarsus an enlargement of mesotarsus, and more conspicuously armed beneath with large, sparse bristles.

Distribution: See types.

Type locality data: MEXICO—Durango (*Durango*, 6(viii)50, C. J. Drake & F. C. Hottes).

Location of types and etymology: Holotypic male, allotype and several paratypes in the collection of Dr. C. J. Drake, Ames, Iowa, to whom the species is dedicated; paratypes in the California Academy of Sciences, San Francisco; and in the collection of the author, Reno, Nevada.

Comparative data: Ambrysus drakei is a member of the *signoreti* group of the genus, and while it is an easily separable species, presents the rather interesting appearance of being intermediate between two of the rather subtle and un-named, but broadly recognizable, sections of the genus. The *signoreti* group *per se* is one in which broadness of form, including emboliar inflation, prominent maculation and quite often pronounced connexival spination, is the rule; whereas the closely related section typified by *A. mexicanus,* is somewhat slimmer, more uniformly colored and relatively or entirely spineless along the connexival margins. In general ovality, noticeable color contrast and lateral connexival spination, *A. drakei* is undeniably a typical part and parcel of the *signoreti* group; in its pronounced *A. mexicanus* type of female subgenital plate outline, it is rather aberrant and closely linked to this latter group. Fortunately, at least with present material, the species is not as confusing as the above comparison may sound, and it readily segregates from its relatives by the insertion of the following auxiliary couplet in the published key to Mexican Ambrysi—

27 (26). Lateral apical angles of female subgenital plate prominent, sharp, even with median, low-rounded angles or sinuosities; median angles set close together, their width across tips 40% or less of total width between lateral apical angles; male genital process either narrowing conspicuously and pointedly toward tip, or weakly goosehead-shaped..27A

—— Lateral apical angles of female subgenital plate weak, although even with median, low-rounded angles or sinuosities, which latter are hardly more than flattened curves along mid-line of tip; median angles wide, their width across tips more than 50% of total width between lateral apical angles; male genital process not distinctive, weakly-to-moderately curved and not shaped as above.....
.....*signoreti-portheo*

27A (27). Connexival angles non-spinose; smaller species, 8.5–9.5 mm. long; lateral apical angles of subgenital plate long, comparatively narrow, sharp and spinosely produced, the concavity between them and the median angles deep; male genital process progressively narrowing to tip, inner terminal corner enormously produced into a straight-edged

long process, somewhat like a greatly exaggerated, thin foot.....*fuscus*

—— Connexival angles spinose; larger species, 12–13 mm. long; lateral apical angles of subgenital plate shorter, broader, although with rather sharp tips, the concavity between them and the median angles rather shallow; male genital process not as above, but much like *guttatipennis*, i.e., somewhat goosehead-shaped.....*drakei*

For those specimens of *A. drakei* which show a slight asymmetry of the left side of the female subgenital plate such as occurs conspicuously in *A. mexicanus*, the spinosity of the connexival angles, size and increased inflation of the embolia (width more than 35% of length) will readily separate them from *A. mexicanus* (= emboliar width less than 35% of length).

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Trichobius (Streblidae) in West Virginia (Dipt.)

By J. O. WHITAKER, JR., 34 East Street, Oneonta, N. Y.

On March 23 and 24, 1957, I found Streblid flies of the genus *Trichobius* on the long-eared bat (*Corynorhinus rafinesquii rafinesquii*) in Pendleton County, West Virginia. There is some disagreement as to the taxonomic standing of this parasite. It is considered as *Trichobius major*, variety *quadrisetosus*, by Kessel (1925), as *Trichobius quadrisetosus* by Curran (1935), and as *Trichobius corynorhini* by Jobling (1938), who considers this and Kessel's variety, *quadrisetosus*, as synonyms. In the key by Kessel, the only difference between *corynorhini* and *major* is the dark line marking the transverse suture in *major*. I am inclined to agree with Jobling, and would designate the West Virginia specimens as *T. corynorhini*, possibly as subspecies *quadrisetosus*.

In the two caves of West Virginia in which I made my collections, Sinnit and Minor Rexrode, I found this fly to be very

common. There were from zero to six flies crawling on each *Corynorhinus,* with an average of about three per bat. This population was marked by very little variation in the taxonomically important characters, with the exception of the number of eye facets. Thirty-seven specimens were examined, and the following results were obtained.

a. The transverse suture of the mesonotum was marked by the dark line in every case.

b. In 33 cases the median line of the mesonotum extended to the transverse suture. In three it extended .8 of that distance, and in one it extended .9 of that distance.

c. The number of scutellar bristles was four in every case.

d. The number of eye facets varied from 12 to 16, with an average of 13.08, and a standard deviation of 1.10.

e. Pubescence was comparatively sparse in all.

f. The sex ratio seemed to be 1:1, with 18 females and 19 males.

In contrast to this, 16 specimens of *Trichobius major,* from Fort Hood, Texas (Host: *Myotis velifer*), collected by H. E. Evans and E. G. Matthews on July 1, 1956, were also examined. According to Dr. Evans these flies were found on the walls of the cave, near the bats. The results were as follows:

a. The transverse suture was dark in 12 of the 15, but light in three. However, the other three were in teneral condition, and I assumed that this line would darken on maturation.

b. The distance the median line extended to the transverse suture on the mesonotum varied from .7 to 1.2, with a mean of 1.1, and a standard deviation of .16.

c. The number of bristles on the scutellum varied from 6 to 9, with an average of 7.75, and a standard deviation of .68.

d. The number of eye facets varied from 6 to 9, with a mean of 7.81, and a standard deviation of .63.

e. Pubescence ranged from very sparse to very dense.

f. This sample contained 8 males and 8 females.

The Texas population is probably much closer to the center of origin and has not been as long isolated from the rest of the *Trichobius* group, thus has not had fixation of characters to

such an extent as the West Virginia group. I would like to examine specimens from Kansas, where both species are known to occur in the same caves, and even on the same individual bat (Jobling, 1949). I would also like to know the extent of the range of the nearctic *Trichobius* (*corynorhini* and *major*) east of Kansas, and whether it is continuous with the range of *Corynorhinus* between Kansas and West Virginia.

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A New Parasitic Ant of the Genus Monomorium from Alabama, with a Consideration of the Status of Genus Epixenus Emery

By W. L. BROWN, JR., and E. O. WILSON, Harvard University, Cambridge, Massachusetts

The specimen described below was found in a nest of *Monomorium minimum* (Buckley) at Tuscaloosa, Alabama. Although we have only a single example, the characters are so distinct that it is evident that we have here another aberrant inquilinous species of the kind now becoming almost a commonplace discovery among the Myrmicinae. It has become the custom to consider parasitic forms of this degree of differentiation from the host species as "new" genera in almost every case found, but we shall give reasons below to show that the designation of new generic names for myrmicine parasites has been a greatly overworked practice, due for critical review.

Monomorium metoecus sp. nov.

Holotype ergatogyne: TL 3.0, HL 0.67, HW 0.54, pronotal W 0.41, WL (alitrunk L) 0.88, petiolar W 0.35, postpetiolar

W 0.36, W first gastric tergite, somewhat collapsed and widened 0.93 mm. Cephalic index 81, scape index 93. W pronotum 0.41, W petiole 0.35 mm.

Head quadrate, without clypeus just about as long as broad; sides nearly parallel (very slightly narrowed behind eyes), feebly convex; occipital margin transverse, straight in full-face view; occipital angles gently rounded. Clypeus convex behind, the median lobe bicarinate, the carinae continued as two acute teeth, each tooth longer than broad at base and inclined very slightly mesad. Space between teeth semicircularly excised, impressed. Compound eyes intermediate in size between those of the worker and female of *M. minimum,* greatest diameter 0.12–0.13 mm. Antennal scapes slender, curved gently flexad, gently incrassate toward tips; exposed length 0.50 mm.; when laid straight back, apices surpassing the occipital border by less than the apical scape width. Funiculus like that of *M. minimum,* but a little more slender. Segment I long and slender, II–VIII small, as broad as long, or broader; IX, X, and XI forming a distinct club, IX and X subequal, both longer than broad; XI (apical segment) longer than IX and X taken together. Mandibles with 4 teeth, increasing in size apicad. Minute vestiges of ocelli present, b[illegible]edingly indistinct, the anterior one connected to clypeus by [illegible]e sulcus. The head in all respects is intermediate bet[illegible] that of the worker and the female of *Monomorium minimum,* except for the longer clypeal teeth (reminiscent of those of *M. viridum* Brown) and the slender antennae.

Form of alitrunk, petiole, postpetiole and base of gaster as shown in fig. 1. Points of greatest interest are the higher and more convex promesonotum and propodeum (as compared to the *M. minimum* worker), the deep metanotal groove, and particularly the curiously hypertrophied nodes of petiole and postpetiole. The postpetiole is produced on each side below as a subacute conule, each conule bearing at its summit a spiracle. Gaster broad and somewhat collapsed.

Integument smooth and shining, with scattered inconspicuous piligerous punctures. Frontal lobes and extreme anterior corners of head longitudinally striate. Striate areas of alitrunk indicated in the figures, as well as the reticulostriate parts of the postpetiole. Center of mesonotum with a small, transversely oval pit or puncture, the detailed structure of which cannot be made out.

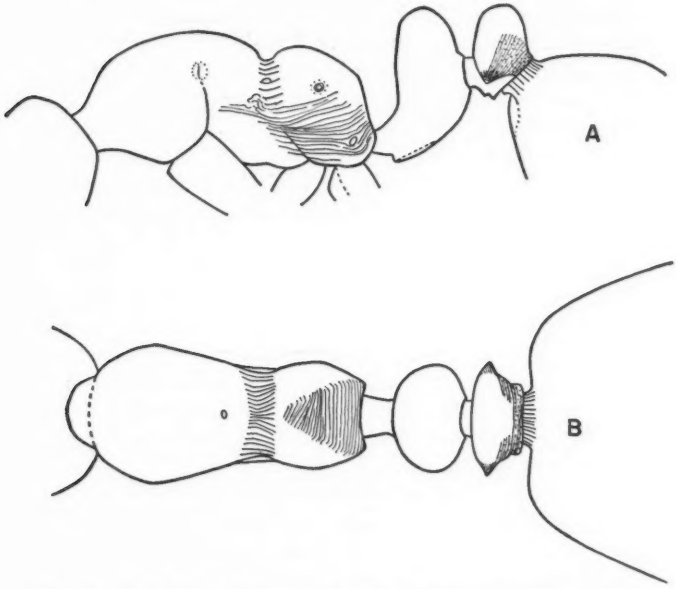

FIG. 1. *Monomorium metoecus* sp. nov., ergatogyne, holotype. A. Side view, and B. dorsal view of alitrunk, petiole, postpetiole and base of gaster. Drawing by Nancy Buffler.

Pilosity abundant, fine, whitish, erect, uneven in length and widely distributed over head, scapes and body. Legs with dilute pubescence of fine appressed hairs. Pilosity intermediate in abundance and conspicuousness between that of the host species workers and queens. Color dark reddish-brown, to the

naked eye appearing blackish; legs, antennae and mandibles tan, shading to yellowish on tarsi.

The holotype, a unique, was taken in a colony of *Monomorium minimum* (Buckley) (*sensu* Creighton) nesting under the loose bark of a living pine tree, just above the ground level, in disturbed open pine woods called "Smith Woods," on the University of Alabama campus at Tuscaloosa, Alabama (E. O. Wilson leg., No. M-178). In the bark of the same tree was found a nest of *Leptothorax bradleyi* Wheeler. The host *Monomorium* nest contained numerous workers, brood, and at least two normal dealate females of the *minimum,* the host species; both females are preserved with workers under the number M-178 in the Museum of Comparative Zoology, which is also the depository for the *M. metoecus* type.

With the exception of the very aberrant petiole and postpetiolar structure, plus other minor details of sculpture, etc., *M. metoecus* is exactly intermediate in every detail between the worker and female castes of *M. minimum.* In fact, if it were not for the form of the nodes, the new species might well have been taken for an ergatoid or pseudogyne of *minimum;* worker-female intermediates are very commonly met with among the species of *Monomorium,* with or without dealate queens, and in quite a few species the ergatogyne is the only functional queen. From these facts, it is clear that the ergatoid condition is in itself no generic character.

This raises the question of the relationship of *Monomorium* to *Epixenus* Emery. *Epixenus* was originally based on an ergatogyne found in the nest of *Monomorium venustum* André in Palestine, and on a doubtful male from Crete, taken separately (Emery, 1908). Forel (1910) added *E. biroi,* based on an ergatogyne found with *M. creticum* Emery, a member of the *salomonis* complex (referred to *salomonis* as a subspecies by Emery in 1922) from Crete. These ergatogynes differ from *Monomorium* ergatogynes only in the form of the petiolar and postpetiolar nodes, which are more than usually anteroposteriorly compressed, and therefore tend to be somewhat scale-like. However, this characteristic shape of the nodes is more a matter

of degree than of absolute qualitative difference, and other *Monomorium* females can be found that more or less approach the condition of the *Epixenus* so far as the nodes are concerned. *M. metoecus,* in fact, has the postpetiolar node more aberrant in form than in any of the *Epixenus* species. From these facts alone, it would seem that *Epixenus* is at best very doubtfully distinct from *Monomorium* at genus, or even at subgenus, level.

Against this background, we can consider the recent contributions by Bernard (1952, 1955) to the taxonomy of *Epixenus.* Bernard first described *E. guineensis* from *workers* taken in West Africa, and then, in his 1955 review of *Epixenus,* he described *E. algiricus* from workers and females from each of a series of colonies taken in Algeria. The figure of the female does not show clearly whether wing stumps are present or absent, though the alitrunk is very narrow and like those of some ergatogynes of other species; Bernard says only that the females are "reines désailées" taken in the nests, and the situation seems to make it fairly certain that these females are not just parasites in the nest of a host species represented by the *E. algiricus* workers (though the parasite hypothesis is not yet entirely to be discarded until a larger number of nests can be examined). Although Bernard emphasizes in his description and figures (especially fig. 1d) the scale-like structure of both nodes, our comparison of two workers from the *algiricus* type series with other workers of the genus *Monomorium* indicates that *algiricus* is only very slightly more extreme in this character than are workers of some other species of *Monomorium,* among which are *M. hesperium* Emery and *M. creticum* Emery. It seems to us that on the basis of worker characters alone, *algiricus, creticum* and *hesperium* could scarcely be put into different species-groups, let alone genera! And it must be remembered that *E. biroi* Forel was described from the nest of *M. creticum,* which suggests that the relationship of these two forms needs to be reexamined, keeping in mind the possibility that *biroi* may be just an ergatoid form of *creticum.*

In discussing the biology of *algiricus,* Bernard makes clear that this species usually nests independently of other ants, and

he believes that in the rest of the cases, it is associated only as a kind of thief-ant with other ant species (other species of *Monomorium* are supposed to follow lestobiotic habits, e.g., *M. andrei fur* Forel). This information eliminates the supposed parasitic habits of *Epixenus* as a group character, even if such habits were ever considered to define a genus in this case at a time when the *Epixenus* workers were still unknown.

Consideration of the above details will, we think, show that what has been considered to constitute a distinct genus, *Epixenus,* is in fact nothing more than a heterogeneous collection of a few species of *Monomorium* that tend to have the nodes more strongly compressed than usual for the genus. Some of these species (e.g., *andrei*) may represent workerless ergatogynous inquilines derived from their host species, while others, such as *algiricus,* seem to be rather average species of *Monomorium.* The larval characters described for *algiricus* by Bernard may be a little unusual for *Monomorium,* but we must remember that only a triflng fraction of the *Monomorium* species have been described in the larval state, and the other *Epixenus* larvae also remain unknown. We offer below the formal synonymy of *Epixenus* with *Monomorium,* and the new combinations necessary after this change.

MONOMORIUM Mayr

Monomorium Mayr, 1855, Verh. zool.-bot. Ver. Wien, 5: 452. Type: *Monomorium minutum* Mayr, monobasic.

Epixenus Emery, 1908, Deutsch. ent. Zeitschr., p. 556. Type: *Epixenus andrei* Emery, by designation of Wheeler, 1911. NEW SYNONOMY.

Monomorium advena nom. nov.

pro *Epixenus andrei* Emery, 1908, Deutsch. ent. Zeitschr., p. 557, fig. 5a–c, female, *nec Monomorium andrei* E. Saunders, 1890, Ent. Mon. Mag., 26: 204, worker.

Monomorium biroi (Forel) comb. nov. (nom. praeocc.)

Epixenus biroi Forel, 1910, Ann. Soc. Ent. Belg., 54: 21, female (ergatogyne), *nec Monomorium biroi* Forel, 1907, Ann. Mus. Nat. Hungar., 5: 19, worker.

We are deliberately entering this name in *Monomorium,* even though it is preoccupied there, because we do not wish to propose a new name where the distinct possibility exists that the *E. biroi* of Forel, 1910, is only the female caste of *Monomorium creticum* Emery, with which it was found. The same applies to the male originally described as *Epixenus creticus* by Emery (see below).

Monomorium creticum (Emery) comb. nov. (nom. praeocc.)
Epixenus creticus Emery, 1908, Deutsch. ent. Zeitschr., p. 558, male, *?nec Monomorium Abeillei* var. *creticum* Emery, 1895, Mem. Accad. Sci. Bologna, (5) 5: 298, worker. As stated above, it may well turn out that *Epixenus creticus* is the male of *Monomorium creticum* Emery, 1895.

Monomorium guineense (Bernard) comb. nov.
Epixenus guineensis Bernard, 1953 (1952), Mém. Inst. Franc. Afr. Noire, Dakar, 19: 238, fig. 10f–i, worker.

This is an aberrant species, with unusual conformation of propodeum and nodes, and very small in body size. Its relationship to the other species of *Monomorium* requires further study.

Monomorium algiricum (Bernard) comb. nov.
Epixenus algiricus Bernard, 1955, Insectes Sociaux, 2: 274, worker, female.

We have made no study of the species of *Monomorium* in order to exhaust the possibilities of synonymy between *algiricum* and the numerous small forms of the genus occurring in North Africa and southern Europe. However, a cursory check of the Museum of Comparative Zoology collections revealed no exactly similar species. *M. hesperium* and *M. creticum* Emery (I) seem to be closely related.

In checking casually through some of the now rather large number of parasitic myrmicine genera, most of which are "satellites" of large genera such as *Myrmica, Solenopsis, Monomorium, Tetramorium, Crematogaster,* and especially *Leptothorax,* one is impressed by the flimsy nature of the characterizations upon which the parasite names rest. In some cases, such as *Teleutomyrmex* or *Anergates,* little doubt about generic

status can be entertained, but in many of the rest, it seems that the known or presumed parasitic habits of the ants have been given undue weight at the generic level. When rigorous taxonomic investigation of these satellite genera is begun in earnest, it seems likely that many of them will go the way of *Epixenus*.

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FOREL, A. 1910. Ann. Soc. Ent. Belg., 54: 6, 21–22.

Nomenclature Notice

All comments relating to the following should be marked with the File Number, and sent in duplicate to Francis Hemming, 28 Park Village East, Regent's Park, London N.W.1, England.

padi Linnaeus, 1758 (*Aphis*), validation of, for the European bird cherry aphid (Hemiptera) (File: Z.N.(S) 1225).
anonyma Lewis, 1872 (*Limenitis*), suppression of (Lepidoptera) (File: Z.N.(S) 1180).

For the above, see Bull. Zool. Nomencl. Vol. 13, Pt. 8.

Pentila Westwood, [1851], validation of, and designation for, and for **Leptina** Westwood, [1851], of type species, in harmony with accustomed usage (Lepidoptera) (File: Z.N.(S) 476).
Centris Fabricius, 1804, designation of type species for, in harmony with accustomed usage; **dimiata** Fabricius, 1793 (**Apis**), validation of (Hymenoptera) (File: Z.N.(S) 770).

For the above see: Bull. Zool. Nomencl. Vol. 13, Pt. 9.

New Records of Plecia (Diptera: Bibionidae)

By Selwyn S. Roback, Assistant Curator, Department of Limnology, Academy of Natural Sciences of Philadelphia

The specimens herein reported are all in the collection of the Academy of Natural Sciences of Philadelphia. The specimen of *Plecia alacris* Curran was taken by the author during the course of the Catherwood Foundation Peruvian Amazon Expedition in 1955. The remaining material was already in the Academy's collection. The author would like to acknowledge gratefully the gift of a male paratype of *P. alacris* by Dr. C. H. Curran of the American Museum of Natural History.

Plecia (Plecia) alacris Curran

Of this species, previously recorded from British Guiana and Paraguay, a single male was taken by the author at Iquitos, Peru, October 20, 1955. This specimen has been compared with the paratype. The description of the species is rather brief, and hence some additional descriptive material is herewith presented.

The male antenna is nine segmented, fig. B, with segments four—eight as wide as long and about equal in length. The maxillary palpus is four segmented with the segments in the ratio of 1.4 : 2.0 : 2.1 : 3.3. The sternopleuron bears a patch of blackish hairs above its middle. The femora are thickened apically and the tibiae swollen in the basal half. The tarsal segments of the foreleg are in the ratio 6.5 : 2.5 : 1.7 : 2.0. Vein R_5 of the wing (fig. A) curves slightly upward to meet the costa rather than curving down with it. The median process of ninth sternum is distinctly truncate apically and is upcurved at its apex (fig. C).

Plecia (Plecia) americana Hardy

A single male from Encero Vera Cruz, S. of Jalapa, Mexico, July 17, 1932 (Hobart Smith). A single paratype is in the

Academy's collection (Philadelphia Academy of Science in Hardy, 1940).

Plecia (Plecia) curvistylata Hardy

This species was described by Hardy (1942) from Cuernavaca, Mexico. There is in the Academy's collection a series of eight males and one female collected July 4, 1932 by Hobart Smith from near Taxco, Guerrero, Mexico, which is close to the type locality. Since the species was described on the basis of only two males, there is offered here a brief description, and figures of the genitalia (figs. D, E) of the female in the Academy's collection. The female genitalia, particularly the form of the eight sternite, supports Hardy's placement of this species with the *collaris* group (see fig. 135B in Hardy, 1945).

Female.—5.4 mm. long; antenna 10 segmented: flagellar segments 2–7 short and broad (1.66 × as wide as long); antennae, palpi, thoracic pleurae, sternum, and abdomen dark brown; mesonotum red-orange; darkened anteriorly but not as distinctly as in the male; wing 6.0 mm.; lightly infuscated; stigmal area not too clearly differentiated; R_{3+4} not as sharply curved as in male; halteres black, shaft brownish; female genitalia, figs. D, E.

Plecia (Rhinoplecia) nearctica Hardy

A common species represented in the Academy's collection by a series of 24 males and 22 females collected by Rehn, Pate, and Rehn, September 4, 1937 between Beaumont, Texas and New Iberia, Louisiana. There are also two paratypes from Hardy's original series in the Academy's collection (listed as Philadelphia Academy of Science in Hardy, 1940).

Plecia (Plecia) plagiata Wiedemann

One female from Juan Vinas, Costa Rica, 2,300 feet, July 22, 1909 (P. P. Calvert).

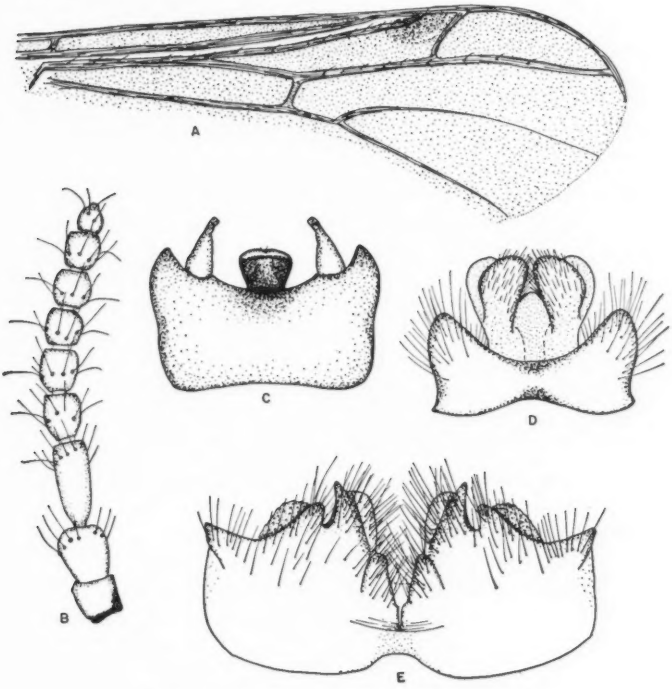
Plecia (Rhinoplecia) rostellata Loew

A series of six males originally determined as *P. rostrata* Bell. by Cresson. These are from Alayuella, Rio Brasil, Costa Rica,

December 9, 1909 (P. P. Calvert). This is a considerable extension of the range of this species.

Plecia (Rhinoplecia) rufithorax concava Hardy

A single male from Piedras Negras, Peten, Guatemala, IV–VI, 1936 (L. Satterthwaite, Jr.).



Plecia alacris Curran. Male. Figures A–C.
A. Anterior portion of wing. B. Antenna. C. Hypopygium, ventral view.

Plecia curvistylata Hardy. Female. Figures D–E.
D. Genitalia, dorsal view. E. Eighth sternum.

LITERATURE

HARDY, D. ELMO. 1940. J. Kans. Ent. Soc. 13, No. 1: 15–27.
——. 1942. Can. Ent. 74: 105–116.
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Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Meetings of the American Entomological Society. Years ago, the NEWS contained a section entitled "Doings of the Societies," which reported the minutes or other matters of interest from this and other societies. Believing that even now there may be some general interest in such things, it may be recorded that at our meetings during the past year, in addition to the minor reports and discussions by those in attendance, there was always an invited speaker of prominence. For the nine meetings, Sept. 1956 to June 1957, we enjoyed the following, each an entomologist of highest competence in the particular field: Dr. RANDALL LATTA, on insect problems in marketing agricultural products; Dr. SELWYN S. ROBACK, on phylogenetic aspects in Diptera; Dr. WALTER FLEMING, on an entomological trip to South America; Mrs. MARGARET M. CARY, on effects of geographic isolation on the evolution of the Sphingidae; Dr. BAILY B. PEPPER, on teaching and research at Rutgers University; Mr. JOHN WILCOX, on the biology and control of ticks; Dr. NEAL A. WEBER, on fungus cultures from ant's nests; Mr. O'DEAN L. KURTZ, on identification of fragments in cereals.

For the current year, the program includes, for September, Dr. THOMAS E. SNYDER, on termite biology, control, trends; for October, probably Dr. GEORGE H. BRADLEY, on some phase of the malaria, or the typhus problem in the U. S.; for November, Dr. HUBERT FRINGS, on the sounds of insects; for December, Dr. JOHN W. H. REHN, on pest control in the U. S. Navy; for January, Dr. HARRY S. SMITH, on plant pest problems in the northeast; and for February, Mr. R. C. BROWN, on forest insect research in the northeast.

The Society welcomes visitors. All with an interest in insects are cordially invited to attend our meetings, especially entomologists from other parts of the country who happen to be passing through Philadelphia. The meetings are at 7.45 P.M. at the Academy of Natural Sciences, s.w. corner of 19th and

Race Streets, on the fourth Thursday of each month from September through May, except in November and December when they are on the third Thursday.

The International Trust for Zoological Nomenclature announces the immediate publication in book-form of the first instalment of each of the **"Official Lists"** of valid zoological names and of the corresponding **"Official Indexes"** of rejected and invalid names, together with the first instalments of the "Official Lists" of works approved as available for zoological nomenclature and of the "Official Index" of rejected and invalid works. The categories of names covered by these "Lists" and "Indexes" range from specific names to ordinal names. The total number of entries contained in the instalments now to be published amounts to about five thousand. These entries have been promulgated from time to time by the International Commission on Zoological Nomenclature in individual "Opinions" and "Directions" but owing to the large number of documents so involved it has become increasingly difficult for specialists to ascertain what names have so far been registered under this system. This difficulty will completely disappear on the publication of the instalments now in the press, each of which will be supplied both with a full alphabetical index and also with alphabetical indexes arranged by major groups.

All enquiries in regard to the above publications should be addressed to the International Trust for Zoological Nomenclature at its Publications Office (41 Queen's Gate, London S.W.7.).—FRANCIS HEMMING.

Books Received

FORSTER, W. and TH. A. WOHLFAHRT. Die Schmetterlinge Mitteleuropas. Lieferung 7 and 8. These represent the first two of the seven that will comprise Volume III (Bombycids and Sphingids) of the butterflies of Europe. The two Lfgs. are each 32 pages and have a total of 7 colored plates. Price, DM 10. each. Franckh'sche Verlagshandlung, Stuttgart-0, Pfizerstr. 5—7.

Volume I (Biology), and Volume II (Diurnals) are complete. Price, DM 23. and DM 53. See ENT. NEWS for July 1952, and Feb. 1955.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Conopidae of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

Anisoptera—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, Dept. of Entomology, N. C. State College, Raleign, N. C.

Bembicini and Stizini (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

Agapema galbina. Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

Tenebrionidae of the World wanted, in exchange for insects of Argentina and neighboring countries. Horacio J. Molinari, Av. Lib. Gral. San Martin 55, Acassuso (Buenos Aires), Rep. Argentina.

Butterflies. Wish to exchange specimens for Japanese species. Please write to Ichiro Nakamura (Boy, age 16), 26 Aza-Nishiyama Obayashi Takarazuka-shi, Hyogo-Ken, Japan.

Phasmidae of nearctic area desired alive. Purchase or trade, drawing on large stock of major orders, worldwide. Dominick J. Pirone, Dept. Entomology, Cornell University, Ithaca, N. Y.

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THE NEOTROPICAL SPECIES OF THE 'SUBGENUS AESCHNA' SENSU SELYSII 1883 (Odonata)

By Philip P. Calvert

This paper presents an account of the Neotropical species referred by de Selys in 1883 to his subgenus *Aeschna* and of some species unknown to him. His subgenus is here divided into three genera, *Aeschna, Coryphaeschna,* and *Castoraeschna, Aeshna* in its turn being subdivided into the subgenera *Aeschna, Hesperaeschna, Rhionaeschna, Schizuraeschna, Marmaraeschna* and *Neureclipa.* These five subgenera include 2, 15, 1, 3, 4 and 5 species and subspecies respectively. *Coryphaeschna* embraces 9 species and subspecies, *Castoraeschna* 5. Larvae of 2 species of *Hesperaeschna,* 1 species of *Schizuraeschna,* 1 species of *Neureclipa* and 6 species of *Coryphaeschna* are described and figured. Generalities are discussed under the headings: Relationships of the Neotropical Aeshnas to the North American fossils; Relations of the South American Aeshnas to the Palaearctic and Australian species; The geological age and geographical distribution of the ancestors of the Odonata and of the Mammalia; Relations of the Neotropical Aeshnas to each other; The seasonal distribution of the Neotropical species of Aeshna. Forty plates in black and white illustrate the structural and colorational features of the adults, seven those of the larvae. Nineteen tables show the variations in size and in venation of the adults. Six maps show the geographic distribution of all the species concerned. There is an alphabetical index of species, subgenera, genera, authors quoted, and topics.

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